

CLAIMS

1. (Original) A communication system for communication using wireless signals, said wireless signals including down-link signals to and up-link signals from mobile stations, said wireless signals having segments including split segments, each having different component segments comprising,

a plurality of transceiver stations having broadcast channels and dedicated channels for said wireless signals,

interleaving means for changing the order of said segments between a normal order and an interleaved order,

zone manager means including,

processor means providing processor information to determine preferred ones of said transceiver stations for particular dedicated channels for a particular mobile station,

control means for dynamically switching among selected ones of said transceiver stations to provide said particular dedicated channels for said particular mobile station, said switching causing ones of said component segments of said split segments to be unavailable for processing at a common location,

split segment processing means for controlling said component segments to enable the processing of said split segments.

2. (Original) The communication system of Claim 1 wherein said dynamic switching causes said component segments of split segments to be at different locations and said split segment processing means controls the assembly of said component segments at said common location to enable processing of said split segments.

3. (Original) The communication system of Claim 1 wherein said communication system is a GSM system.

1 4. (Original) The communication system of Claim 1 wherein said system includes one or more particular
2 additional mobile stations and said zone manager means, for said particular mobile station and said one or
3 more particular additional mobile stations, includes a particular zone manager that functions as a host zone
4 manager for said particular mobile station and functions as an assistant zone manager for said one or more
5 particular additional mobile stations, said host zone manager operative to communicate over said particular
6 broadcast channels with said particular mobile station while said particular dedicated channels for said
7 particular mobile station are dynamically switched among said one or more assistant zone managers and
8 said particular zone manager.

1 5. (Original) The communication system of Claim 1 wherein,
2 said control means is responsive to said processor information for switching said dedicated
3 channels as frequently as a signal switch time determined as a function of a frame rate of
4 said up-link signals.

1 6. (Original) The communication system of Claim 5 wherein said switch time is approximately determined
2 by an up-link signal frame rate of said up-link signals.

1 7. (Original) The communication system of Claim 6 wherein said switch time is determined as a function
2 of a multiple of a frame rate of said up-link signals.

1 8. (Original) The communication system of Claim 5 wherein said switch time is less than 1 second.

1 9. (Original) The communication system of Claim 1 wherein said zone manager means is formed of a
2 plurality of zone managers, one for each of said transceiver stations.

1 10. (Original) The communication system of Claim 9 wherein said zone managers are co-located with
2 said transceiver stations at macrodiverse locations.

1 11. (Original) The communication system of Claim 10 wherein said zone managers are interconnected
2 with each other forming a network.

1 12. (Original) The communication system of Claim 10 wherein two or more of said zone managers are
2 co-located at a common location.

1 13. (Original) The communication system of Claim 12 wherein said common location is a base station
2 controller in a cellular system.

1 14. (Original) The communication system of Claim 9 wherein said plurality of zone managers includes,
2 for said particular mobile station, a host zone manager and one or more assistant zone managers, said host
3 zone manager operative to communicate over said particular broadcast channels with said particular mobile
4 station while said particular dedicated channels for said particular mobile station are dynamically switched
5 among said one or more assistant zone managers and said host zone manager.

1 15. (Original) The communication system of Claim 9 wherein,
2 said transceiver stations include a plurality of macro-diverse broadcasters distributed at macro-
3 diverse broadcaster locations for broadcasting said down-link signals and include a
4 plurality of macro-diverse collector means distributed at macro-diverse collector locations
5 for receiving said up-link signals and providing received signals for said particular mobile
6 station,
7 said processor means for a host zone manager provides host processor information for determining
8 preferred ones of said broadcasters and preferred ones of said collectors for said
9 particular dedicated channels for said particular mobile station,
10 said control means dynamically selects said particular dedicated channels for said particular mobile
11 station by selecting said preferred ones of said broadcasters to provide particular down-
12 link signals and dynamically selects said preferred ones of said collectors to receive
13 particular up-link signals for said particular mobile station.

1 16. (Original) The communication system of Claim 15 wherein,
2 said control means for said host zone manager is responsive to said host processor information for
3 switching said particular dedicated channel.

1 17. (Original) The communication system of Claim 15 wherein,
2 said control means for said host zone manager is responsive to said host processor information for
3 switching said particular dedicated channel as frequently as a signal switch time determined
4 as a function of said up-link signal frame rate.

1 18. (Original) The communication system of Claim 17 wherein said switch time is determined as a
2 function of a multiple of said up-link signal frame rate.

1 19. (Original) The communication system of Claim 1 wherein,
2 control means for said host zone manager has the capacity for making changes as frequently as a
3 signal switch time determined as a function of said up-link signal frame rate.

1 20. (Original) The communication system of Claim 1 wherein said manager means is formed of a plurality
2 of zone managers, one for each of said transceiver stations, each particular one of said zone managers
3 having,
4 control means including,
5 a resource manager for managing available resources in said communication system,
6 an airlink controller for controlling the radio channels in said communication system,
7 interface means for providing interfaces for said particular one of said zone managers.

1 21. (Original) The communication system of Claim 20 wherein said interface means includes a
2 zone_manager-to-zone_manager interface manager for controlling zone manager links among said zone
3 managers.

1 22. (Original) The communication system of Claim 20 wherein said interface means includes a transceiver
2 interface for controlling a transceiver link from said particular one of said zone managers to a corresponding
3 transceiver station.

1 23. (Original) The communication system of Claim 20 wherein said communication system includes a
2 controller link connected to said base station controller, to one of said transceiver stations and to one or
3 more of said zone managers.

1 24. (Original) The communication system of Claim 23 wherein said controller link is an Abis link.

1 25. (Original) The communication system of Claim 23 wherein one or more of said zone managers is
2 integrated into one or more of said transceiver stations.

1 26. (Original) The communication system of Claim 1 wherein said control means includes broadcaster
2 commands for controlling the down-link signals to each of selected ones of said mobile stations and
3 collector commands for controlling the plurality of macro-diverse collectors for switching the up-link signals
4 for each of other selected ones of said mobile stations.

1 27. (Original) The communication system of Claim 1 wherein said wireless signals employ multiple access
2 protocols.

1 28. (Original) The communication system of Claim 27 wherein said wireless signals employ TDMA
2 protocols.

1 29. (Original) The communication system of Claim 1 wherein said transceiver stations communicate over
2 a region containing one or more zones.

1 30. (Original) The communication system of Claim 1 wherein said split segment processing means
2 operates for TCH/FS signals in a GSM system.

1 31. (Original) The communication system of Claim 1 operating in a GSM system wherein said zone
2 manager means is formed of a plurality of zone managers, one for each of said transceiver stations, and said
3 split segment processing means operates for TCH/FS signals.

1 32. (Original) The communication system of Claim 31 wherein said split segment processing means
2 forwards TRAU data including a split segment from one of said zone managers to another of said zone
3 managers for uplink TCH/FS signals.

1 33. (Original) The communication system of Claim 31 wherein said split segment processing means
2 allocates duplicate resources for duplicate processing of split segments for uplink TCH/FS signals.

1 34. (Original) The communication system of Claim 31 wherein said split segment processing means
2 forwards untransmitted data including a split segment from one of said zone managers to another of said
3 zone managers for downlink TCH/FS signals.

1 35. (Original) The communication system of Claim 31 wherein said split segment processing means
2 forwards TRAU data including a split segment from one of said zone managers to another of said zone
3 managers for downlink TCH/FS signals.

1 36. (Original) The communication system of Claim 1 operating in a GSM system wherein said zone
2 manager means is formed of a plurality of zone managers, one for each of said transceiver stations, and said
3 split segment processing means operates for FACCH/FS signals.

1 37. (Original) The communication system of Claim 36 wherein said split segment processing means
2 inhibits said control means from switching to prevent split segments from being created for uplink
3 FACCH/FS signals.

1 38. (Original) The communication system of Claim 36 wherein said split segment processing means
2 forwards FACCH/FS data including a split segment from one of said zone managers to another of said
3 zone managers for uplink FACCH/FS signals.

1 39. (Original) The communication system of Claim 36 wherein said split segment processing means
2 allocates duplicate resources for duplicate processing of split segments for uplink FACCH/FS signals.

1 40. (Original) The communication system of Claim 36 wherein said split segment processing means
2 inhibits said control means from switching to prevent split segments from being created for downlink
3 FACCH/FS signals.

1 41. (Original) The communication system of Claim 36 wherein said split segment processing means
2 forwards untransmitted data including a split segment from one of said zone managers to another of said
3 zone managers for FACCH/FS signals.

1 42. (Original) The communication system of Claim 36 wherein said split segment processing means
2 forwards a layer 2 block including a split segment from one of said zone managers to another of said zone
3 managers for FACCH/FS signals.

1 43. (Original) The communication system of Claim 1 operating in a GSM system wherein said zone
2 manager means is formed of a plurality of zone managers, one for each of said transceiver stations, and said
3 split segment processing means operates for SACCH/FS signals.

1 44. (Original) The communication system of Claim 43 wherein said split segment processing means
2 inhibits said control means from switching to prevent split segments from being created for uplink
3 SACCH/FS signals.

1 45. (Original) The communication system of Claim 43 wherein said zone managers include a host zone
2 manager associated with a host transceiver station and wherein said split segments and other of said
3 segments are sent to said host zone manager and said host transceiver station for decoding said uplink
4 SACCH/FS signals.

1 46. (Original) The communication system of Claim 43 wherein said zone managers include a host zone
2 manager associated with a host transceiver station and wherein said segments including soft bits are sent
3 to said host zone manager and said host transceiver station for decoding said uplink SACCH/FS signals
4 using said soft bits.

1 47. (Original) The communication system of Claim 43 wherein said zone managers include a host zone
2 manager associated with a host transceiver station and one or more assistant zone managers associated with
3 one or more assistant transceiver stations and wherein said segments including soft bits are sent to said host
4 zone manager and to one of said assistant zone managers and a corresponding assistant transceiver station
5 for decoding said uplink SACCH/FS signals using said soft bits.

1 48. (Original) The communication system of Claim 46 wherein soft bits are stored under control of said
2 zone managers and, after said switching among said transceiver stations, a last one of said transceiver
3 stations selected receives said soft bits and decodes said uplink SACCH/FS signals.

1 49. (Original) The communication system of Claim 46 wherein soft bits are stored under control of said
2 zone managers and, after said switching among said transceiver stations, said host zone manager decides
3 which one of said transceiver stations is to receive said soft bits and decodes said uplink SACCH/FS
4 signals.

1 50. (Original) The communication system of Claim 46 wherein soft bits are stored under control of said
2 zone managers and, after said switching among said transceiver stations, a first one of said transceiver
3 stations selected receives said soft bits and decodes said uplink SACCH/FS signals.

1 51. (Original) The communication system of Claim 46 wherein said split segment processing means
2 inhibits said control means from switching to prevent split segments from being created for downlink
3 SACCH/FS signals.

1 52. (Original) The communication system of Claim 46 wherein said zone managers include a host zone
2 manager associated with a host transceiver station and wherein said segments are sent to said host zone
3 manager and said host transceiver station for decoding said downlink SACCH/FS signals.

1 53. (Original) The communication system of Claim 46 wherein said zone managers include a host zone
2 manager associated with a host transceiver station and one or more assistant zone managers associated with
3 one or more assistant transceiver stations and wherein said split segments and other of said segments are
4 sent to said host zone manager and said host transceiver station decodes said downlink SACCH/FS.

1 54. (Original) The communication system of Claim 46 wherein said zone managers include a host zone
2 manager associated with a host transceiver station and one or more assistant zone managers associated with
3 one or more assistant transceiver stations and wherein said host zone manager performs channel encoding
4 and sends SACCH/FS frames to an assistant transceiver station with a frame number to which a
5 SACCH/FS frame is to be sent .

1 55. (Original) In a communication system for communication using wireless signals, said wireless signals
2 including down-link signals to and up-link signals from mobile stations, said wireless signals having segments
3 including split segments each having different component segments, the method comprising,
4 transmitting, from a plurality of transceiver stations, broadcast channels and dedicated channels for
5 said wireless signals,
6 switching the order of said segments between a normal order and an interleaved order,
7 providing processor information to determine preferred ones of said transceiver stations for
8 particular dedicated channels for a particular mobile station,
9 dynamically switching among selected ones of said transceiver stations to provide said particular
10 dedicated channels for said particular mobile station, said switching causing ones of said
11 component segments of said split segments to be unavailable for processing at a common
12 location,
13 controlling said component segments to enable the processing of said split segments.

1 56. (Original) In the method of Claim 55 wherein said dynamic switching causes said component
2 segments for split segments to be at different locations and said step of controlling said component
3 segments controls the assembly of said component segments at said common location to enable
4 processing of said split segments.

1 57. (Original) In the method of Claim 55,
2 switching said dedicated channels as frequently as a signal switch time determined as a
3 function of the up-link signal frame rate.

1 58. (Original) In the method of Claim 57 wherein said switch time is approximately an up-link
2 signal frame rate of said up-link signals.

1 59. (Original) In the method of Claim 58 wherein said switch time is a multiple of said up-link
2 signal frame rate.

1 60. (Original) In the communication system of Claim 58 wherein said switch time is less than 1
2 second.

1 61. (Original) A communication system for communication using GSM wireless signals, said
2 wireless signals including down-link signals to and up-link signals from mobile stations, said wireless
3 signals having segments including split segments where each split segment has different component
4 segments comprising,

5 a plurality of transceiver stations having broadcast channels and dedicated channels for
6 said wireless signals,

7 interleaving means for changing the order of said segments between a normal order and
8 an interleaved order,

9 zone manager means including,

10 processor means providing processor information to determine preferred ones of
11 said transceiver stations for particular dedicated channels for particular
12 mobile stations,

13 control means for dynamically switching said dedicated channels, as frequently as
14 a signal switch time determined as a function of a frame rate of said up-link
15 signals, among selected ones of said transceiver stations to provide said
16 particular dedicated channels for said particular mobile stations, said
17 switching causing ones of said component segments to be at different
18 locations and unavailable for processing at certain locations,

19 a zone manager for each particular mobile station including,

20 one particular zone manager functioning as a host zone manager for one
21 of said particular mobile stations and functioning as an assistant
22 zone manager for other ones of said particular mobile stations,
23 other particular zone managers functioning as host zone managers for
24 other ones of said particular mobile stations and functioning as

25 assistant zone managers for still additional ones of said particular
26 mobile stations,
27 said particular zone manager operative to communicate over a particular
28 broadcast channel with said one of said particular mobile stations
29 while a particular dedicated channel for said one of said particular
30 mobile stations is dynamically switched among said other
31 particular zone managers functioning as assistant zone managers,
32 split segment processing means for controlling the assembly of said component
33 segments at common location to enable processing of said split segments.

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